IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln. No.	:	10/814,764	Confirmation No.:	8867
Applicant	:	FIRST, Eric R.		
Filed	:	March 31, 2004		
TC/A.U.	:	1645		
Examiner	:	PORTNER, Virginia Allen		
Docket No.	:	17672 (BOT)		
Customer No.	:	51,957		
Title	:	PRESSURE SORE TREATMENT		

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
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DECLARATION OF STEPHEN DONOVAN UNDER 37 CFR § 1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Stephen Donovan, declare the following:

1. I am presently Vice Persistent and Assistant General Counsel for Allergan, Inc., and a registered patent attorney.

2. I have authority to sign this 37 CFR §1.131 declaration on behalf of Allergan, Inc.

3. Allergan, Inc. is the assignee of the entire right and interest of United States patent application serial number (USPASN) 10/814,764 (hereinafter the '764 application) filed March 31, 2004. (The Executed Assignment documents are attached at Exhibit A (redacted)).

4. The inventor and assignor to Allergan, Inc. of the '764 application, Dr. Eric R. First is no longer an employee of Allergan, Inc. and is not available to sign this 37 CFR §1.131 declaration.

5. I have read and understand the Office Action dated March 14, 2008 wherein the pending claims (claims 1, 5-6, 13-15 19 and 21) in the '764 application have been rejected as anticipated under 35 U.S.C. §102(e) by USPASN 11,072/026 (hereinafter the '026 application) filed March 3, 2005 and claiming priority to a March 3, 2004 provisional patent application (the effective filing date under 35 U.S.C. §102(e)).

6. I understand that to the extent that Allergan, Inc. can document that our former employee, and inventor of the claimed subject matter in the '764 application, Dr. First, first conceived and later diligently reduced to practice the invention presently claimed in the '764 application on a date prior to the effective filing date of the '026 application (March 3, 2004) that the '026 application can no longer be asserted as prior art against the rejected claims.

7. Attached as Exhibit B is an excerpt from the record of invention (ROI) prepared and signed by the sole inventor, Dr. First prior to March, 3 2004 (dates redetected).

8. The ROI documents conception and diligent reduction to practice of the claimed treatment of pressure sores in the United States.

9. I acknowledge that the ROI is a true and authentic copy, and is owned by Allergan, Inc.

10. I am aware that the sole inventor, Dr. First, conceived and invented the disclosed and claimed subject matter in the present application, Serial No. 10/814,764, before 3 March 2004.

11. All statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that the statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

12. I further acknowledge my duty of candor and good faith in dealings before the United States Patent and Trademark Office related to the above entitled application pursuant to 37 CFR §1.56.

Authorized Applicant Representative
Stephen Donovan, Vice President
Allergan, Inc.

Date 7/11/08

Exhibit A

ASSIGNMENT

WHEREAS I, ERIC R. FIRST, of Suffolk COUNTY, MASSACHUSETTS (hereinafter referred to as ASSIGNOR), have invented and own a certain invention entitled **Pressure Sore Treatment**, for which application for Letters Patent of the United States was executed by me herein.

WHEREAS, Allergan, Inc., having its principal place of business at 2525 Dupont Drive, Irvine, CA 92612 (hereinafter referred to as ASSIGNEE), is desirous of acquiring the entire interest in, to and under said invention and in, to and under Letters Patent or similar legal protection to be obtained therefor in the United States and in any and all foreign countries.

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN, be it known that in consideration of the payment by ASSIGNEE TO ASSIGNOR of the sum of One Dollar ($1.00), the receipt of which is hereby acknowledged, and for other good and valuable consideration, ASSIGNOR hereby sells, assigns and transfers to ASSIGNEE the full and exclusive right, title and interest to said invention in the United States and its territorial possessions and in all foreign countries to all Letters Patent or similar legal protection in the United States and its territorial possessions and in any and all foreign countries to be obtained for said invention by said application or any continuation, divisional, renewal, substitute or reissue thereof or any legal equivalent thereof in a foreign country for the full term or terms for which the same may be granted.

ASSIGNOR hereby covenants that no assignment, sale, agreement or encumbrance has been or will be made or entered into which would conflict with this assignment and sale;

ASSIGNOR further covenants that ASSIGNEE will, upon its request, be provided promptly with all pertinent facts and documents relating to said application, said invention and said Letters Patent and legal equivalents in foreign countries as may be known and accessible to ASSIGNOR and will testify as to the same in any interference or litigation related thereto and will promptly execute and deliver to ASSIGNEE or its legal representative any and all papers, instruments or affidavits required to apply for, obtain, maintain, issue and enforce said application, said invention and said Letters Patent and said equivalent thereof in any foreign country which may be necessary or desirable to carry out the purposes thereof.

IN WITNESS WHEREOF, I/We have hereunto set hand and seal this

3rd day of March 2004

ERIC R. FIRST

(State of MASSACHUSETTS)
ss:
County of Suffolk)

On 3/3/04 before me, Dana Victos Nordhardt Notary Public, personally appeared ERIC R. FIRST, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her authorized capacity, and that by his/her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Notary Public
My commission expires
June 20, 2008.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

SEPTEMBER 26, 2004

PTAS

102717049A

ALLERGAN, INC.
STEPHEN DONOVAN
2525 DUPONT DRIVE
IRVINE, CA 92612

UNITED STATES PATENT AND TRADEMARK OFFICE
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 703-308-9723. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, ASSIGNMENT DIVISION, BOX ASSIGNMENTS, CG-4, 1213 JEFFERSON DAVIS HWY, SUITE 320, WASHINGTON, D.C. 20231.

RECORDATION DATE: 03/31/2004

REEL/FRAME: 015180/0333
NUMBER OF PAGES: 4

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).
DOCKET NUMBER: 17672 (BOT)

ASSIGNOR:
FIRST, ERIC R.

DOC. DATE: 03/03/2004

ASSIGNEE:
ALLERGAN, INC.
2525 DUPONT DRIVE
IRVINE, CALIFORNIA 92612

SERIAL NUMBER: 10814764
PATENT NUMBER:
TITLE: PRESSURE SORE TREATMENT

FILING DATE: 03/31/2004
ISSUE DATE:

MAURICE CARTER, PARALEGAL
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

Exhibit B

ALLERGAN **RECORD OF INVENTION** **ROI No.**

Date:

GENERAL AREA OF RESEARCH:

Retinoids ☐ Contact Lens Care ☐ BOTOX® ☒ Surgical ☐

All Other Pharm ☐ Other ☐

1. **PROPOSED TITLE OF INVENTION:**

Novel Methods for Treating Bed Sores (Skin Ulcers)

2. **GENERAL DESCRIPTION:** (If new chemical compound - formula of generic concept, sample preparation from known starting materials. If new pharmaceutical composition or use - ingredients, dose regimens and preparation. If machine or chemical process - critical components and operation. Pinpoint novel features. Point out use or advantage of invention in detail. Indicate specific compounds of interest by name and Allergan Compound Number with test results. Attach additional pages or diagrams as necessary.)

Bed sores can occur when a person is bedridden, unconscious, unable to sense pain, or immobile. Bed sores are ulcers that occur on areas of the skin that are under pressure from lying in bed, sitting in a wheelchair, and/or wearing a cast for a prolonged period of time, causing considerable pain and discomfort to the patient.

Bed sores often occur in the buttocks area (on the sacrum or iliac crest), or on the heels of foot. A bed sore develops when blood supply to the skin is cut off for more than two to three hours. As the skin dies, the bed sore first starts as a red, painful area, which eventually turns purple. Left untreated, the skin can break open and become infected. A bed sore can become deep, extending into the muscle. Once a bed sore develops, it is often very slow to heal. Early intervention with Btx, upon detection of these initial signs as delsclosed above may prevent further breakdown, pain and inflammation. (perhaps use IM, ID, topical methods?)

Botulinum toxin has been shown to be effective in treating various pain and inflammatory-related conditions such as: migraine. Recent evidence implicates that botulinum toxin may relieve pain and or inflammtion due to it's effects on neuropeptides such as but not limited to, substance-P, VIP and cGRP, which are involved in pain signal transmission. Botulinum toxin administered to the affected areas via but not limited to: direct application to the affected area, IV injection, into the affected area, could significantly reduce the inflammation and pain in bed sores.

The description, mechanism, examples, and dose will be submitted upon request.

4. PERSONS CORROBORATING INVENTION:

Eric R. First, M.D.

5. INVENTOR(S): (If not a United States citizen, note country)

1) *First Name*	*Middle Initial*	*Last*	*Date*
Eric	R.	First	
Street Address	*City*	*State and Zip Code*	*Country of Citizenship*
5264 N Bay Ridge Ave	Whitefish Bay	WI 53217	
Signature:			

2) *First Name*	*Middle Initial*	*Last*	*Date*
Street Address	*City*	*State and Zip Code*	*Country of Citizenship*
Signature:			

3) *First Name*	*Middle Initial*	*Last*	*Date*
Street Address	*City*	*State and Zip Code*	*Country of Citizenship*
Signature:			

4) *First Name*	*Middle Initial*	*Last*	*Date*
Street Address	*City*	*State and Zip Code*	*Country of Citizenship*
Signature:			

APPROVAL FOR SUBMISSION
(read and understood)

By: _____
Department Head
(Full Name)

Date:

RECEIVED BY
INTELLECTUAL PROPERTY DEPARTMENT

By: _____

Date: _____

ORIGINAL TO BE RETAINED BY INTELLECTUAL PROPERTY DEPARTMENT

Rev. 11/2001

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Treatment of Bed Sores

The terms decubitus ulcer and pressure sore often are used interchangeably in the medical community. Decubitus, from the Latin decumbere, means "to lie down." Decubitus ulcer, therefore, does not adequately describe ulceration that occurs in other positions, such as prolonged sitting (eg, the commonly encountered ischial tuberosity ulcer). Because the common denominator of all such ulcerations is pressure, pressure sore is the better term to describe this condition *(Revis,D)*

Presently, treatment of pressure sores in the United States is estimated to cost in excess of $1 billion annually. (Barbenel JC, et al., 1977).

Frequency: Two thirds of pressure sores occur in patients older than 70 years. The prevalence rate in nursing homes is estimated to be 17-28%. Among patients who are neurologically impaired, pressure sores occur with an annual incidence of 5-8%, with lifetime risk estimated to be 25-85%. Moreover, pressure sores are listed as the direct cause of death in 7-8% of all paraplegics. Patients hospitalized with acute illness have an incidence rate of pressure sores of 3-11%. Disturbingly, even with current medical and surgical therapies, patients who achieve a healed wound have recurrence rates of as high as 90%.

Etiology
Pressure is exerted on the skin, soft tissue, muscle, and bone by the weight of an individual against a surface beneath. These pressures are often in excess of capillary filling pressure, approximately 32 mm Hg. In patients with normal sensitivity, mobility, and mental faculty, pressure sores do not occur. Feedback, both conscious and unconscious, from the areas of compression leads individuals to change body position. These changes shift the pressure prior to any irreversible tissue damage.
Individuals unable to avoid long periods of uninterrupted pressure over bony prominences are at increased risk for the development of necrosis and ulceration. This group of patients typically includes elderly individuals, those who are neurologically impaired, and those who are acutely hospitalized. These individuals cannot protect themselves from the pressure exerted on their bodies unless they consciously change position or have assistance in doing so. Even the most conscientious patient with an extensive support group and unlimited financial resources may develop ulceration resulting from a brief lapse in avoidance of the ill effects of pressure. *Dinsdale SM 1974; El-Toraei I, & Chung B 1977).*

Many factors contribute to the development of pressure sores, but pressure leading to ischemia is the final common pathway. Tissues are capable of withstanding enormous pressures when brief in duration, but prolonged exposure to pressures slightly above capillary filling pressure initiates a downward spiral towards ulceration.

Impaired mobility is an important contributing factor. Patients who are neurologically impaired, heavily sedated, restrained, or demented are incapable of assuming the responsibility of altering their position to relieve pressure. Moreover, this paralysis leads to muscle and soft tissue atrophy, decreasing the bulk over which these bony prominences are supported *Dinsdale SM 1974.*

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Contractures and spasticity often contribute by repeatedly exposing tissues to pressure through flexion of a joint. Contractures rigidly hold a joint in flexion, while spasticity subjects tissues to considerable repeated friction and shear forces.

Pathophysiology: The inciting event is compression of the tissues by an external force such as a mattress, wheelchair pad, or bed rail. Other traumatic forces that may be present include shear forces and friction. These forces cause microcirculatory occlusion as pressures rise above capillary filling pressure, resulting in ischemia. Ischemia leads to inflammation and tissue anoxia. Tissue anoxia leads to cell death, necrosis, and ulceration. *(Relander M, & Palmer B 1988; Reuler JB, & Cooney TG 1981).*

Irreversible changes may occur after as little as 2 hours of uninterrupted pressure.
Clinical: Clinical presentation of pressure sores can be quite deceiving to the inexperienced observer. Soft tissues, muscle, and skin have a differential resistance to the effects of pressure. Generally, muscle is the least resistant and will necrose prior to skin breakdown. Also, pressure is not equally distributed from the bony surface to the overlying skin. Pressure is greatest at the bony prominence, decreasing gradually towards the periphery. Once a small area of skin breakdown has occurred, one may be viewing only the tip of the iceberg, with a large cavity and extensive undermining of the skin edges. *(Relander M, & Palmer B 1988).*

Many classification systems for staging pressure ulcers have been presented in the literature. The most widely accepted system is that of Shea, which has been modified to represent the present National Pressure Ulcer Advisory Panel classification system. This system consists of 4 stages of ulceration but is not intended to imply that all pressure sores follow a standard progression from stage I to stage IV. Nor does it imply that healing pressure sores follow a standard regression from stage IV, to stage I, to healed wound. Rather, it is a system designed to describe the depth of a pressure sore at the specific time of examination, to facilitate communication among the various disciplines involved in the study and care of such patients. *(Staas WE & Jr, LaMantia JG 1982)*

Stage I represents intact skin with signs of impending ulceration. Initially this would consist of blanchable erythema from reactive hyperemia that should resolve within 24 hours of the relief of pressure. Warmth and induration also may be present. Continued pressure creates erythema that does not blanch with pressure. This may be the first outward sign of tissue destruction. Finally, the skin may appear white from ischemia *(Revis, 2001)*

Stage II represents a partial-thickness loss of skin involving epidermis and possibly dermis. This lesion may present as an abrasion, blister, or superficial ulceration *(Revis, 2001).*

Stage III represents a full-thickness loss of skin with extension into subcutaneous tissue but not through the underlying fascia. This lesion presents as a crater with or without undermining of adjacent tissue *(Revis, 2001).*

Stage IV represents full-thickness loss of skin and subcutaneous tissue and extension into muscle, bone, tendon, or joint capsule. Osteomyelitis with bone destruction, dislocations, or pathologic fractures may be present. Sinus tracts and severe undermining commonly are present. *(Revis, 2001).*

Medical therapy: The first step in resolution is to reduce or eliminate the cause, ie, pressure. Specialized support surfaces are available for bedding and wheelchairs, which can maintain tissues at pressures below 30 mm Hg. These specialized surfaces include foam devices, air-filled

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devices, low-airloss beds (Flexicair, KinAir), and air-fluidized beds (Clinitron, FluidAir). Low-airloss beds support the patient on multiple inflatable air-permeable pillows. Air-fluidized beds suspend the patient as air is pumped into an air-permeable mattress containing millions of microspheric uniformly sized silicone-coated beads. No one device has been shown to be clearly superior over the others, but they all have been shown to reduce tissue pressure over conventional hospital mattresses and wheelchair cushions. Over 75 companies sell pressure-reduction devices, with annual industry revenues in excess of $8 billion. *(Klitzman B, et al., 1998)*

Wound dressings vary with the state of the wound. A stage I lesion with signs of impending breakdown may require no dressing. Stage II ulcers confined to the epidermis or dermis may be treated with a hydrocolloid occlusive dressing (DuoDerm), which maintains a moist environment to facilitate reepithelialization. For more advanced ulcers, a large variety of treatment options is available. These include wet-to-dry dressings, incorporating isotonic sodium chloride solution or dilute Dakins solution (sodium hypochlorite), Silvadene, Sulfamylon, hydrogels (Carrington gel), xerogels (Sorbsan), and vacuum-assisted closure (VAC) sponges. Daily whirlpool use also may serve to irrigate and mechanically debride the wound.

Spasticity should be relieved with diazepam, baclofen, dantrolene sodium, mephenesin carbonate, dimethothiazine, or orciprenaline. Flexion contractures may be relieved surgically.

Surgical therapy: Even with optimal medical management, many patients require a trip to the operating room for debridement, diversion of urinary or fecal stream, release of flexion contractures, wound closure, or amputation.

Control of spasticity and maintenance of adequate nutrition also must be continued into the outpatient setting to prevent recurrence.

Botulinum Toxin for Treatment of Decubitus Ulcers

Botulinum toxin has been shown to be effective in treating pain and inflammatory components underlying disorders such as Migraine, and painful conditions. In-vivo rat studies have demonstrated the effectiveness of Btx-A and is thought to affect pain and inflammation via inhibition of associated neuropeptides (Aoki, et al., Cui et al.).

Various ways in which this invention has discovered that BoNT may effectively decrease or prevent onset of ulcers are its effects on contractures in spasticity (refs) , which often contribute by repeatedly exposing tissues to pressure through flexion of a joint. Contractures rigidly hold a joint in flexion, while spasticity subjects tissues to considerable repeated friction and shear forces. Unexpectedly however, is that upon application of BoNT to the ulcerative area, BoNT decreases or inhibits the chronic inflammation that results from the shearing and trauma resulting from the pressure eventually causing formation of microcirculatory occlusion as pressures rise above capillary filling pressure, resulting in ischemialeading to inflammation and tissue anoxia. Tissue anoxia leads to cell death, necrosis, and ulceration.
In response to the pressure this inflammatory phase consists of release of various mediators that can cause plasma extravasation, leaking, causing and weakening in the vessel. In response, to the damaged vessels, signaling via mediators released, cause the production of new blood vessels to infiltrate the area. This recruitment may be a function of the releasing of mediators and the amount or degree of production could be proportional to this release. Therefore, by inhibiting the release of mediators w/ BoNT, recruitment of new blood vessels could decrease.

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Methods of treatment:

This invention discloses a method to treat, the following non-limiting examples: decubitus ulcers, ulcers of the heel of the foot, ulcer of the shoulder, ulcers caused by any part of the body that can exert an effective amount of pressure so as to create a condition suitable for ulcer formation, optimally treating in but not limited to: stage I or stage II of the National Pressure Ulcer Advisory Panel classification system. BoNT is applied in an effective therapeutic amount by but not limited to the foregoing calculation: 1U BoNT/A/cm2 of the affected area. Methods to apply BoNT includes but not limited to: s.c., i.d., i.m., topical, via slow release. BoNT may be applied as a single agent, or in combination with a bacteriostatic agent, anti-biotic cream or emollient, or any other agent that may be considered to be used in the management of ulcers.

BoNT used alone or in combination with above agents may also be used along with the following non-limiting examples of dressings and occlusives: Stage II ulcers confined to the epidermis or dermis may be treated with a hydrocolloid occlusive dressing (DuoDerm), which maintains a moist environment to facilitate reepithelialization. For more advanced ulcers, a large variety of treatment options is available. These include wet-to-dry dressings, incorporating isotonic sodium chloride solution or dilute Dakins solution (sodium hypochlorite), Silvadene, Sulfamylon, hydrogels (Carrington gel), xerogels (Sorbsan), and vacuum-assisted closure (VAC) sponges.

BoNT used alone or in combination with above agents may also be used along with the following non-limiting examples body support : specialized support surfaces are available for bedding and wheelchairs, which can maintain tissues at pressures below 30 mm Hg. These specialized surfaces include foam devices, air-filled devices, low-airloss beds (Flexicair, KinAir), and air-fluidized beds (Clinitron, FluidAir). Low-airloss beds support the patient on multiple inflatable air-permeable pillows. Air-fluidized beds suspend the patient as air is pumped into an air-permeable mattress containing millions of microspheric uniformly sized silicone-coated beads.

Examples:

Case 1—A 52 year old woman weighing 42 kg had carcinoma of the vulva. She was otherwise fit and active. She smoked 20 cigarettes a day. She had a radical vulvectomy and bilateral inguinal lymphadenectomy under combined general and epidural anaesthesia. She was given 20 ml of 0.25% bupivacaine for epidural anaesthesia. To prevent pressure sores, the operating table was covered with silicon jelly pads. Surgery lasted about three hours. The patient was supine for the first 90 minutes and in the lithotomy position thereafter. Her preoperative blood pressure was 120/70 mm Hg. During surgery her systolic blood pressure varied between 85 and 90 mm Hg and her general condition was stable. She received a continuous epidural infusion of plain 0.15% bupivacaine for postoperative analgesia. She remained free of pain and was comfortable. Her systolic blood pressure varied between 75 and 85 mm Hg. She was unable to move her legs on the first postoperative day, but could move them on the second day. On the third day, the epidural was discontinued, and she could get out of bed and walk. On the fourth day she noticed blisters and small areas of discoloration on her heels. Over the next three days the blisters developed into ulcers. Five weeks later at outpatient follow up her heels were worse, with severe pressure necrosis of both heels (fig 1). She had lymphoedema of both legs. The ulcers took between eight and nine months to heal.

Case 1

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A 72-year-old male with diabetes developed 4 Stage III pressure ulcers (sacrum, both left trochanter, and both heels) after a cerebral infarction caused tetraplegia. He was hospitalized for treatment of hyperglycemia (400 mg/dL) and a high fever caused by wound infection. Black necrotic tissue in the sacral and trochanteric ulcers was then partially resected, and the wounds were packed with gauze soaked in povidone-iodine. This wound treatment continued for 3months, with no resolution of the ulcers. Given the patients diabetic state and non-surgical status, a course of BoNT/A was recommended for his ulcers. A total of 200U was applied (1Ucm2: total of 50U/4 sites for sacrum, total 50 U/2 sites for trochanter, and total of 50U/2 sites for each heel. Injections were i.d.

After 2 weeks, bleeding and pain ceased. New granulation tissue began to form within the ulcers. After the necrotic tissue was removed, PV film dressing was used to cover the sacral and trochanteric wounds. 6 weeks later all 4 ulcers had reduced in size significantly, with only the sacral ulcer still visible.

Case 2

An 87-year-old female developed a Stage II sacral pressure ulcer during hospitalization for a cerebral infarction. As a result of the stroke, patient had spastic lower limbs, that contracted limbs, creating pressure on both heels. In order to prevent further onset of ulcers, the patients spasticity was treated with 400U of BoNT divided into 200U per limb, which was distributed in 4 sites i.m. per limb. In addition, 50U BoNT was injected s.c., into the region the stage II ulcers, dividing into 2 sites per heel. 4 weeks later, patient's spasms were significantly reduced, both ulcers were significantly reduced, and patient reported no pain. 6 weeks later, patient still had reduction in spasm, and no noticible signs of ulcers.

An 43 year old woman, was admitted following a fall from a 10 story building. After 2 months of admission, patient began to develop significant pain and tenderness in sacral region. On admission to rehabilitation, the patient was evaluated and placed on a Stage III mattress overlay. Prior to this the patient had been lying prone since her admission to acute care. It was recommended that the patient begin a course of BoNT to prevent progression to Stage IV ulcer. After debridement, 100U of BoNT admixed into vehicle comprised of bacitracin ointment and was applied topically in a concentration of 1U/1ml of ointment and applied as 1U/cm2. 4 weeks later, significant reduction in size of the ulcer was noted, and pain and discomfort were absent. 6 weeks later patient was able to move around in the bed with no discomfort.